

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 88-107

NPDES NO. CA0005789

AMENDING WASTE DISCHARGE REQUIREMENTS:

SHELL OIL COMPANY  
MARTINEZ MANUFACTURING COMPLEX  
CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereafter called the Board) finds that:

1. On February 20, 1985 the Board adopted Order No. 85-22, a National Pollutant Discharge Elimination System (NPDES) Permit, prescribing waste discharge requirements for Shell Oil Company, Martinez Manufacturing Complex (hereinafter called the discharger or Shell). This Order was amended by Board Orders 87-10 and 87-100.
2. The discharger proposes to use up to 2.5 million gallons per day of reclaimed water, provided by the Central Contra Costa Sanitary District and the Contra Costa Water District, in a demonstration project to test the feasibility of using this water for cooling tower make-up water. During this demonstration project, the impact of using the reclaimed water on cooling tower operation and the overall industrial wastewater discharges will be evaluated by Shell.
3. The source of this reclaimed water is the Central Contra Costa Sanitary District NPDES permitted discharge, (NPDES Permit No. CA0037648, Order No. 84-77). This water receives further treatment to soften, filter and disinfect it to meet the standards of Title 22 of the California Health and Safety Code.
4. On May 18, 1988, the Board adopted Resolution No. 88-083, "Statement of Support for Municipal Wastewater Reuse in Petroleum Refinery Operations, Contra Costa County".
5. The Central Contra Costa Sanitary District is permitted to discharge pollutants to Carquinez Straits in compliance with the effluent limitations contained in their NPDES permit. These pollutants will be present in the influent to Shell Oil Company's cooling tower during the demonstration project.
6. Pollutants present in the Central Contra Costa Sanitary District effluent may cause a net increase in the pollutants present in the final discharge from Shell Oil Company. The total discharge of pollutants from the combined discharges of Shell Oil Company and Central Costa Contra Sanitary District will not increase as a result of this permit amendment.
7. Effluent limits contained in Shell's NPDES permit do not currently provide for pollutants present in the influent water to the cooling

tower demonstration project.

8. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. Table 4-1 of the Basin Plan contains concentration limits for heavy metals, cyanide, phenols and polynuclear aromatic hydrocarbons. These limits are to be included in NPDES permits at the earliest opportunity. The Discharger is currently seeking an alternative to the Table 4-1 limit for cyanide according to Basin Plan provisions.
9. As this project is an NPDES Permit amendment, this Board, pursuant to Water Code Section 13389, is not required to comply with the provisions of Chapter 3 of Division 13 of the Public Resources Code (California Environmental Quality Act).
10. The Board has notified the discharger and interested persons and agencies of its intent to amend waste discharge requirements for the discharger.
11. The Board in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that this Board's Order No. 85-22 is amended as follows:

1. Effluent Limitation A.8. is included to read as follows:
8. The discharge of Waste 001 containing constituents in excess of the following limits is prohibited, with the following condition:

When the Discharger uses reclaimed water between June 15, 1988 and December 31, 1988 as influent water for cooling tower make-up water at a flowrate of 2.5 million gallons per day or less, credit for influent concentrations of the constituents listed below shall be granted in the effluent according to the following procedure.

- a. Constituents for which effluent limit credit is sought must be sampled at least as frequently as is required in Part B of the attached self-monitoring program for that constituent. Influent sampling will occur at influent sampling station I-1 defined in Section I.C. of Part B of the Self-Monitoring Program. The Discharger must also determine the time interval between introduction of a given constituent of concern in the influent water and the first appearance of this constituent in the final effluent. This determination must precede any calculation of credit for influent constituents.
- b. Credit for constituents listed in this table will be given on a mass basis. Influent concentration multiplied by total influent reclaimed water flow volume for that monitoring interval will yield an influent mass for each constituent, which is valid for that monitoring interval. After the appropriate time lag interval described in a. above, this influent mass of the constituent is then divided by the total effluent flow volume for that monitoring

period to give a concentration credit for the effluent which will apply for the monitoring interval. This concentration credit is added to the existing concentration limit. The monitoring interval is the time interval between sampling days; for example, weekly sampling yields a one week monitoring interval. A schematic example follows:

For constituent A, monitoring interval - one week, lag time 15 days

$(\text{Influent concentration A}) \times (\text{Total influent flow volume for one week}) = (\text{Influent mass for constituent A})$

$(\text{Influent mass for constituent A}) / (\text{Total effluent flow volume for one week, 15 days after influent week}) = (\text{Concentration credit to be added to existing concentration limit, valid for one week})$

<u>Constituent</u>	<u>Units</u>	<u>Maximum Daily</u>
a. Arsenic	ug/l	200
b. Cadmium	ug/l	30
c. Chromium (VI) <sup>a</sup>	ug/l	110
d. Copper	ug/l	200
e. Cyanide	ug/l	25 <sup>b</sup>
f. Lead	ug/l	56
g. Mercury	ug/l	1
h. Nickel	ug/l	71
i. Silver	ug/l	23
j. Zinc	ug/l	580
k. Phenols	ug/l	500
l. PAHs <sup>c</sup>	ug/l	150

- The Discharger may at their option meet this limit as total chromium.
- The Discharger has initiated a proposal for an alternate limit for cyanide following procedures outlined in the Basin Plan. A time schedule for submittal of a proposed alternate limit is presented in the Provisions section of this order.
- As identified by EPA Method 610. If a discharge exceeds the limit for PAHs, concentrations of individual constituents should be reported.

2. Provision 6. is revised to read as follows:

6. The Discharger shall comply with the attached self-monitoring program as adopted by the Board and as may be amended by the Board pursuant to EPA regulations 40 CFR 122.62, 122.63, and 124.5. The Discharger may petition the Board for modification of the self-monitoring program based on historical compliance data.

3. Provision 16. is included to read as follows:

16. Compliance with Effluent Limitation A.8.e. or any amendments to Effluent Limitation A.8.e. shall be achieved according to the following time schedule:

Task

Compliance Date

a. Complete an investigation to determine if all sources of cyanide are being controlled through the application of all reasonable treatment and source control measures and submit a report on the findings. If the report determines that all sources of cyanide are not being controlled through the application of all reasonable treatment and source control measures, then the report shall include a schedule of actions along with milestone dates, acceptable to the Board's Executive Officer which will assure that all sources of cyanide are being controlled through the application of all reasonable treatment and source control measures.

September 1, 1988

b. Achieve full compliance with Effluent Limitation A.8.e. or submit a proposed alternate cyanide effluent limit. If the Discharger is proposing an alternate cyanide effluent limit, then the Discharger must complete an investigation and submit a report in conformance with the 1986 Basin Plan. The report shall include an assessment of the impact of the proposed alternate cyanide effluent limit on the beneficial uses of the receiving water, and must include a demonstration that the costs of additional measures do not bear a reasonable relationship to the level of beneficial uses protected by such additional measures. The report shall also include a schedule of specific control strategies along with milestone dates, acceptable to the Board's Executive Officer, for the control of non-point sources of pollution (including urban

July 1, 1989

runoff) within or upstream from the Discharger's receiving water segment in order to reduce uncertainty regarding the Discharger's contribution to the total pollutant load.

c. Achieve full compliance with the cyanide limit listed under Effluent Limitation A.8.e. of this order or an alternate to Effluent Limitation A.8.e. which is approved by the Board. November 1, 1989

d. Submit annual progress reports quantifying any improvements in the amount of cyanide reaching the Discharger's receiving water segment from the Discharger's effluent and/or from non-point sources of pollution. March 1 (each year from 1990 through 1994)

4. Provision 17. is included to read as follows:

17. Compliance with Effluent Limitation A.8.h. or any amendments to Effluent Limitation A.8.h. shall be achieved according to the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
a. Complete a Source Confirmation Survey to confirm preliminary determinations of nickel sources and further investigate chemical species of nickel involved. Report on the findings of the study.	July 1, 1988
b. Complete a Nickel Reduction Treatability Study by performing batch lab experiments on source samples to screen possible treatment options. Report on the findings of the study and plans for scaled up process tests. If an alternate effluent limit for nickel is still sought at this time, submit a proposal for an investigation in conformance with the 1986 Basin Plan. The investigation shall assess the impact of the proposed nickel limit on the beneficial uses of the receiving water, and must include a demonstration that the costs of additional measures do not bear a reasonable relationship to the level of beneficial uses protected by such additional measures. The proposal must also address the development of specific control strategies for control of non-point sources of pollution (including urban runoff) within or upstream from the Discharger's receiving water segment in order to reduce uncertainty regarding the Discharger's contribution to the total	August 1, 1988

pollutant load.

- c. Complete pilot plant or full scale trials of a successfully tested bench scale treatment technology and report on results of these trials. November 1, 1988
- d. Submit design and construction schedule for new or modified treatment process. If alternate limit is still sought, submit complete alternate limit proposal described in proposal submitted under item b. above. January 1, 1989
- e. Achieve full compliance with the cyanide limit listed under Effluent Limitation A.8.h. of this order or an alternate to Effluent Limitation A.8.h. which is approved by the Board. July 1, 1989

5. Provision 18. is included to read as follows:

- 18. The Discharger shall develop and submit a Best Management Practices (BMP) program to the Board by December 1, 1988. The BMP program shall be consistent with the EPA regulations 40 CFR 125, Subpart K and the general guidance contained in the "NPDES Best Management Guidance Document", EPA Report No. 600/9-79-045, December 1979 (revised June 1981). The BMP program shall specifically address segregating non-contaminated stormwater from the wastewater treatment system. A BMP program acceptable to the Executive Officer shall be implemented by February 1, 1989.

6. Provision 19. is included to read as follows:

- 19. When the Discharger uses reclaimed water during the time period of June 15, 1988 to December 31, 1988 as influent water for cooling tower make-up at a flowrate of 2.5 million gallons per day or less, pursuant to 40 CFR 122.45(g), credit for constituents listed in Effluent Limitation A.1. which are detected in the influent reclaimed water will be given according to the following procedure:
  - a. Constituents for which effluent limit credit is sought must be sampled at least as frequently as is required in Part B. of the attached Self-Monitoring Program for that constituent. Influent sampling will occur at influent sampling station I-1 defined in Section I.C. of part B of the Self-Monitoring Program. The Discharger must also determine the time interval between introduction of a given constituent of concern in the influent water and the first appearance of this constituent in the final effluent. This determination must precede any calculation of credit for influent constituents.

- b. Influent concentration multiplied by total influent reclaimed water flow volume for that monitoring interval, and divided by the number of days in that monitoring interval will yield a daily influent mass for each constituent, which is valid for that monitoring interval. After the appropriate time lag interval described in a. above, this daily influent mass of constituents is added to the existing mass limits in Effluent Limitation A.1., and is valid for a time period equivalent to the monitoring interval. The monitoring interval is the time interval between sampling days; for example, weekly sampling yields a one week monitoring interval. A schematic example follows:

For constituent A, monitoring interval - one week, lag time 15 days

$$(\text{Influent concentration A}) \times (\text{Total influent flow volume for one week}) / (7 \text{ days}) = (\text{Daily influent mass})$$

After 15 day lag time, Daily influent mass is added to effluent limit for A, and is valid for one week.

7. Provision 20. is included to read as follows:

20. If during the demonstration phase of the use of reclaimed water for cooling tower make-up, from June 15, 1988 to December 31, 1988, the Discharger experiences violations of NPDES waste discharge requirements and presents substantial evidence that the cause of violation was the use of reclaimed water, the staff and Board will include this information in any consideration of enforcement.

8. Provision 21. is included to read as follows:

21. The following constituents shall be analyzed at receiving water sampling stations C-0, C-2, C-5, C-R1, and C-R2 on a monthly basis:

- a. Nickel
- b. Copper
- c. Chromium (Total)
- d. Selenium
- e. Zinc

Table 1. of Part B. of the Self-Monitoring Program included in Order 85-22 is replaced by the attached revised Table 1.

9. The following addition is made to Section I. of Part B of the Self-Monitoring Program:

C. INFLUENT WATERS


Station

Description

I-1

Located at any point in the pipe which delivers only reclaimed water to the facility, but upstream of any water treatment unit, blending point or point of use.

I, Roger B. James, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 15, 1988.



Roger B. James  
Executive Officer

Attachment



NPDES PERMIT NO. CA0005789

REVISED TABLE 1.  
OF  
SELF MONITORING PLAN  
PART B.



TABLE 1 (continued)

### SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	E-001 and E-006	(8)	E-002 thru 005	All C	E-007
TYPE OF SAMPLE	C-24	G	G	G	
Mercury (mg/l & kg/day)	2M				
Nickel (mg/l & kg/day)	W			M	
Vanadium (mg/l + kg/day)	W				
Zinc (mg/l & kg/day)	M			M	
Phenolic Compounds (mg/l & kg/day)	W				
All Applicable Standard Observations			(10) E		E (10)
Soluble BOD (mg/l)	W <sup>(9)</sup>				
Total Ident. Chlor. Hydro- carbons (mg/l & kg/day)					
Total Organic Carbon (TOC)			(10) E	-	E (10)
Hexavalent Chromium	W				
Unionized Ammonia (as N)				M	
Selenium (11)	W			M	
Volatile Organics (5)	2/Y <sup>(7)</sup>				
Acid Base/Neutral Organics (6)	2/Y <sup>(7)</sup>				
Polynuclear Aromatic Hydrocarbons (12)	M				

### LEGEND FOR TABLE 1

#### TYPES OF SAMPLES

G = grab sample  
C-24 = composite sample - 24-hour  
Cont = continuous sampling  
O = observation

#### TYPES OF STATIONS

I = intake stations  
E = waste effluent stations  
C = receiving water stations  
B = bottom sediment stations

#### FREQUENCY OF SAMPLING

E = each occurrence      M = once each month  
D = once each day      2M = every 2 months  
W = once each week      Y = once each year  
2/W = 2 days per week      cont = continuous

### FOOTNOTES FOR TABLE 1

- (1) Oil and grease sampling shall consist of 3 grab samples taken at 2 hour intervals during the sampling day, with each grab being collected in a glass container. The entire volume of each sample shall be composited prior to analysis. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent rinsings as soon as possible after use, and the solvent rinsings shall be added to the composite wastewater sample for extraction and analysis.
- (2) Daily minimum and maximum shall be reported.
- (3) Static bioassays shall be utilized to determine compliance for the first eight months subsequent to adoption of this permit. The discharger shall complete construction of the flow-through bioassay such that concurrent (static and flow-through) bioassay tests shall be conducted during the last two months of the initial eight month period. Thereafter the discharger shall determine compliance utilizing flow-through bioassays. Immediately upon the death of over half the test fish, the LC-50 of the discharge shall be determined using at least 4 dilutions in a static bioassay.
- (4) Receiving water analysis for sulfides should be run when dissolved oxygen is less than 5.0 mg/l.
- (5) Volatile Organic Toxic Pollutants shall be analyzed using EPA Method 624 of the July, 1982, Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057. In addition, all other peaks appearing in the reconstructed ion chromatograph above the detection limit shall be quantified based on the nearest internal standard.

FOOTNOTES FOR TABLE 1 CONT.

- (6) Acid and Base/Neutral Extractable Organic Toxic Pollutants shall be analyzed using EPA Method 625 of the July, 1982, Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057. In addition, the five most prominent peaks appearing in the reconstructed ion chromatograph above the detection limit shall be quantified based on the nearest internal standard.
- (7) 24-hour composite samples shall be collected and shall consist of eight grab samples collected at three-hour intervals. The analytical laboratory shall remove flow-proportioned volumes from each sample vial or container for the analysis.
- (8) Take samples of Waste 006 only during emergency periods when discharge of Waste 006 occurs.
- (9) Soluble BOD is defined here as the 5-day, 20°C BOD of filtrate that passes through a standard glass fiber filter as described in Standard Methods for the Examination of Water and Wastewater, 15th Edition, Part 209 B., APHA, AWWA, WPCF, (1980).
- (10) Stormwater-runoff sampling shall consist of a single grab sample during the first hour of runoff from the first storm of each calendar month.
- (11) Selenium must be analyzed only by the atomic absorption, gaseous hydride procedure (EPA Method No. 270.3/ Standard Method No. 303 E).
- (12) Polynuclear Aromatic Hydrocarbons shall be analyzed using EPA Method 610 of the July, 1982, Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. Note that the samples must be collected in amber glass containers. An automated sampler which incorporates glass sample containers and keeps the samples refrigerated at 4°C and protected from light during compositing may be used. Note that the 24-hour composite samples may consist of eight grab samples collected at three-hour intervals. The analytical laboratory shall remove flow-proportioned volumes from each sample vial or container for the analysis.